

ARITHMETIC (Q 1, PAPER 1)

1997

- 1 (a) A machine broke down at 0935 hours. It was repaired at 1210 hours. For how many hours and minutes was the machine out of order?
- (b) IR£2500 was invested for three years at compound interest. The rate of interest was 4% per annum for the first year and 3% per annum for the second year. Calculate the amount of the investment after two years. If the investment amounted to IR£2744.95 after three years, calculate the rate of interest per annum for the third year.
- (c) (i) The length and breadth of a rectangle are in the ratio 9:5, respectively. The length of the rectangle is 22.5 cm. Find its breadth.
- (ii) Tea served in a canteen is made from a mixture of two different types of tea, type A and type B. Type A costs IR£4.05 per kg. Type B costs IR£4.30 per kg. The mixture costs IR£4.20 per kg. If the mixture contains 7 kg of type A, how many kilograms of type B does it contain?

SOLUTION

1 (a)

60 seconds = 1 minute
60 minutes = 1 hour

Hours	Minutes	Hours	Minutes
12	10	11	70
9	35	9	35
		2	35

Use the calculator as shown below.

CALCULATOR: Subtract 9 hours 35 minutes from 12 hours 10 minutes.

The calculator interface shows the following sequence of operations: 1, 2, °, ', ', 1, 0, °, ', ', -, 9, °, ', ', 3, 5, °, ', ', =. The display shows the calculation $12^10 - 9^35$ and the result $2^35'0''$.

1 (b)

Year 1:

$$P = \text{£}2500$$

$$R = 4\%$$

$$n = 1$$

$$A_1 = ?$$

$$A = P \left(1 + \frac{R}{100} \right)^n \dots\dots \textcircled{3}$$

$$A_1 = 2500 \left(1 + \frac{4}{100} \right)^1 = 2500(1.04) = \text{£}2600$$

Year 2:

$$P = \text{£}2600$$

$$R = 3\%$$

$$n = 1$$

$$A_2 = ?$$

$$A_2 = 2600 \left(1 + \frac{3}{100} \right)^1 = 2600(1.03) = \text{£}2678$$

Year 3:

$$P = \text{£}2678$$

$$R = ?$$

$$n = 1$$

$$A_3 = \text{£}2744.95$$

$$2744.95 = 2678 \left(1 + \frac{R}{100} \right)^1 \Rightarrow \frac{2744.95}{2678} = 1 + \frac{R}{100}$$

$$\Rightarrow 1.025 = 1 + \frac{R}{100} \Rightarrow \frac{R}{100} = 0.025$$

$$\therefore R = 0.025(100) = 2.5\%$$

1 (c) (i)

Ratio 9:5.

$$9 + 5 = 14$$

$$\text{Length: } \frac{9}{14} = 22.5 \text{ cm}$$

$$\frac{1}{14} = \frac{22.5}{9} \text{ cm}$$

$$\text{Breadth: } \frac{5}{14} = \frac{22.5}{9} \times 5 \text{ cm} = 12.5 \text{ cm}$$

1 (c) (ii)

Type A	Mixture	Type B
£4.05 per kg	£4.20 per kg	£4.30 per kg

Type A is £0.15 per kg cheaper than the mixture.

Type B is £0.1 per kg dearer than the mixture.

The ratio is $0.15 : 0.1 = 3 : 2$

The mixture contains 7 kg of Type A.

Therefore, the mixture contains $7 \times \frac{3}{2} = 10.5$ kg of Type B.